



**SF Environment**

**Our home. Our city. Our planet.**

A Department of the City and County of San Francisco

# San Francisco: Energy Storage Brief

## June 2017



# San Francisco: Low Carbon Economy (LCE)



Photo credit: Merri, Flickr

19.5%  
Population

78%  
GDP

28%  
GHG Emissions

# USDOE Grant: Storage for Resiliency



## RESILIENT SAN FRANCISCO

STRONGER TODAY, STRONGER TOMORROW.



San Francisco

## Climate Action Strategy



Powered by

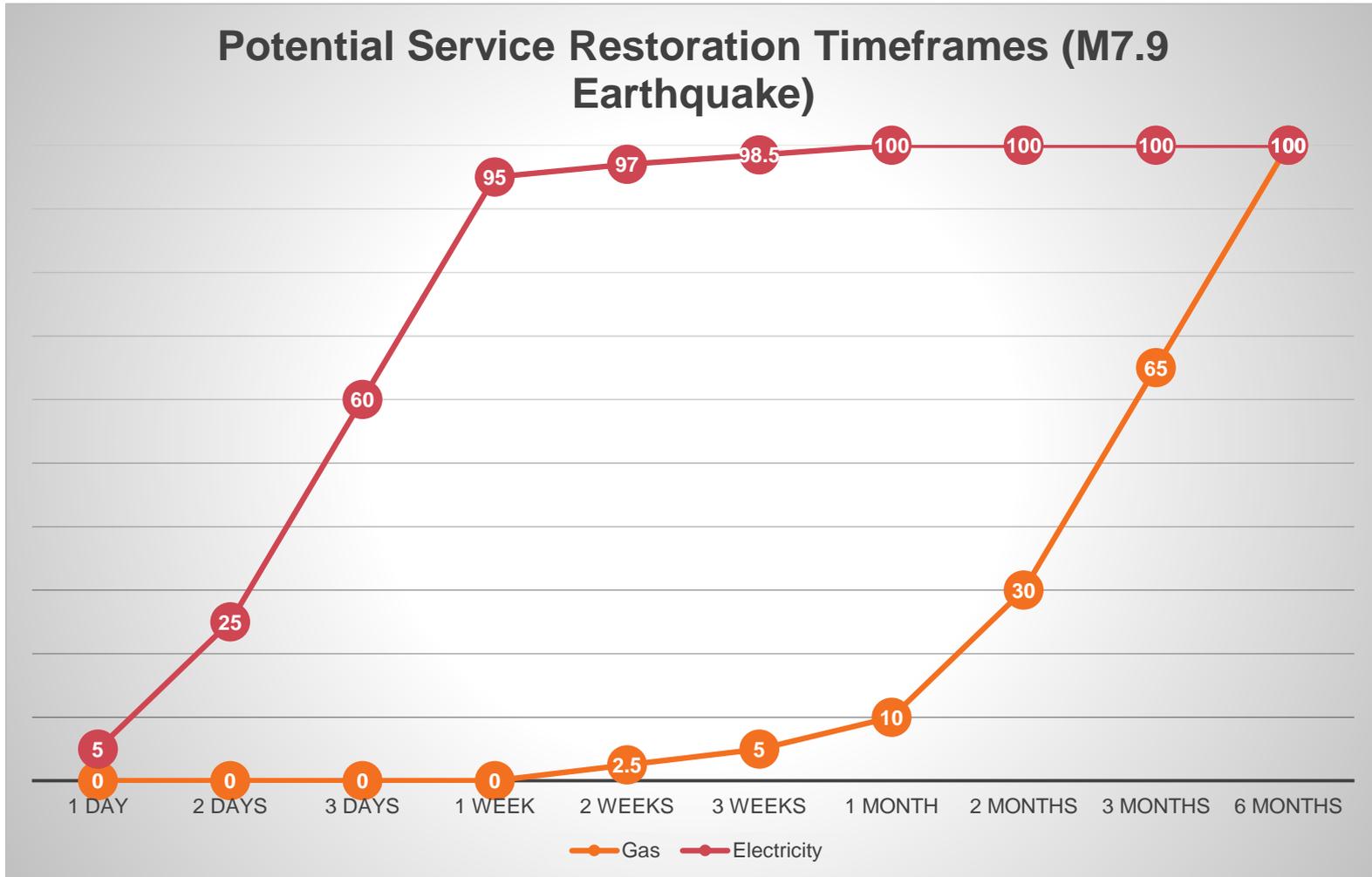
**SunShot**

U.S. Department of Energy

# Plan: 3-7 Day Electricity Outage



## Potential Service Restoration Timeframes (M7.9 Earthquake)



Data: SF Lifelines Council, April 2014

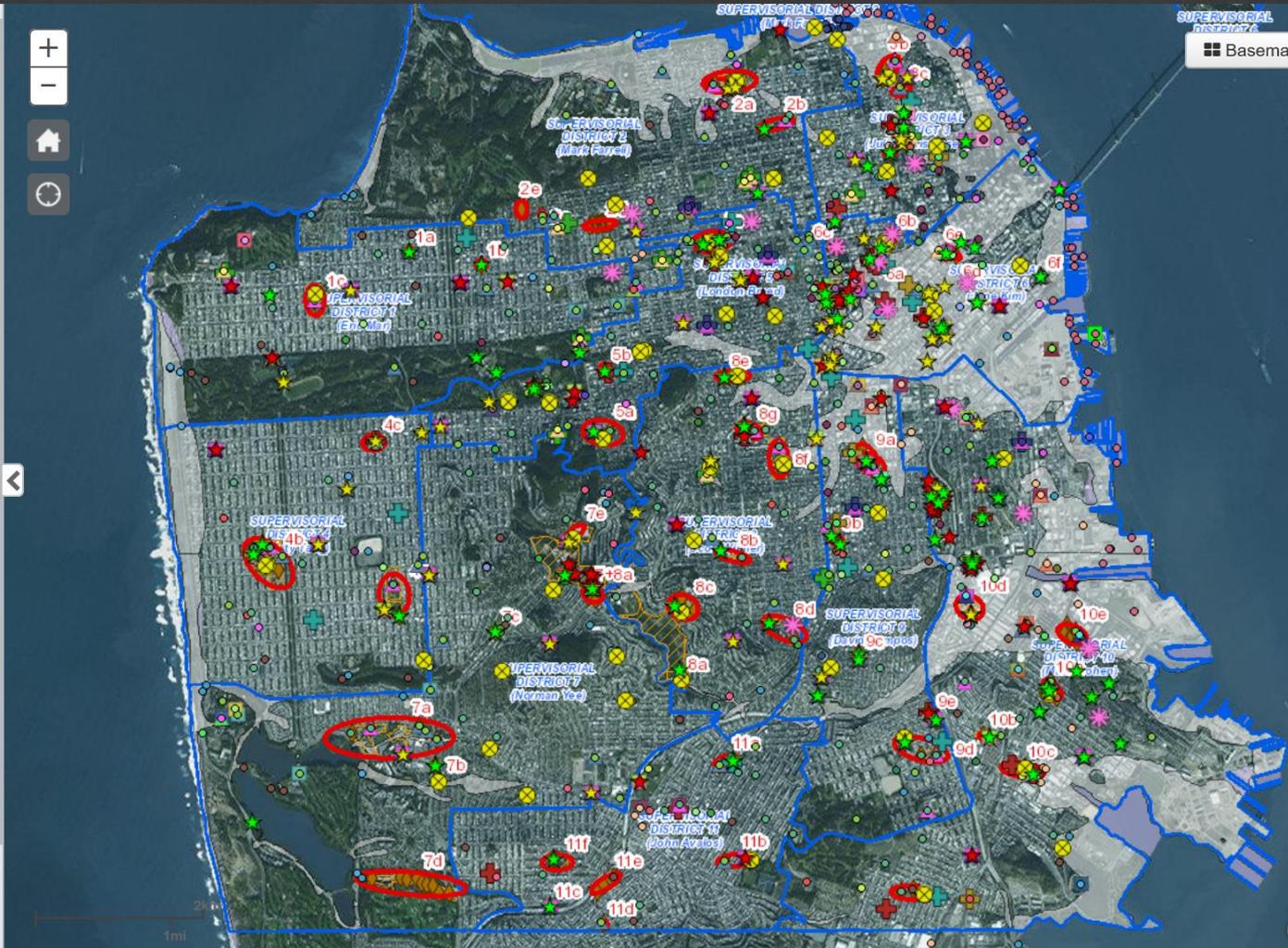
# Site Selection



ARUP Solar+Energy Storage for Resiliency  
spatial data viewer

Help

- Legend
- Layers
  - Hazus Results
    - Critical Infrastructure
      - Primary NGO Kitchens - 2015
      - NERT Staging Location
      - All Facilities
      - Facilities with Critical Power Need
      - Facilities with Generators
      - Medical Assets
    - Microgrids
      - Selected Sites
      - Original Sites Under Consideration
    - City Data
    - Hazards
      - C05 - San Andreas
      - C06 - Hayward
      - C07 - Soil Liquefaction
      - C08 - Landslide
      - C09 - Tsunami
      - C13 - Wildfire
      - C14 - Reservoir Inundation
      - C18 - Heat Vulnerability
  - Bookmarks
  - Identify
  - Find

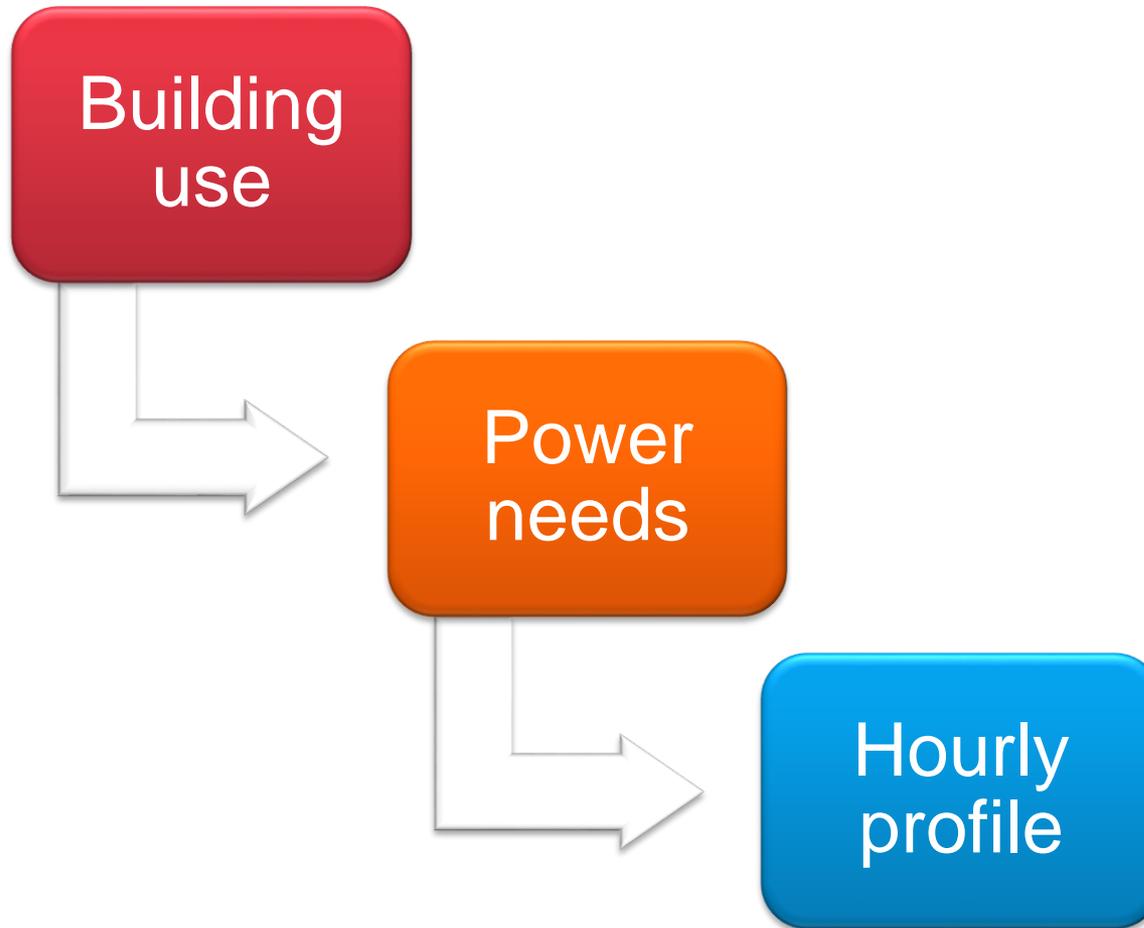


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# Typical Site



# Critical Loads Assessment



# System Sizing Tool



## PV System

Array size:  
76 kW

Existing array size:  
0 kW

Annual generation:  
118,000 kWh



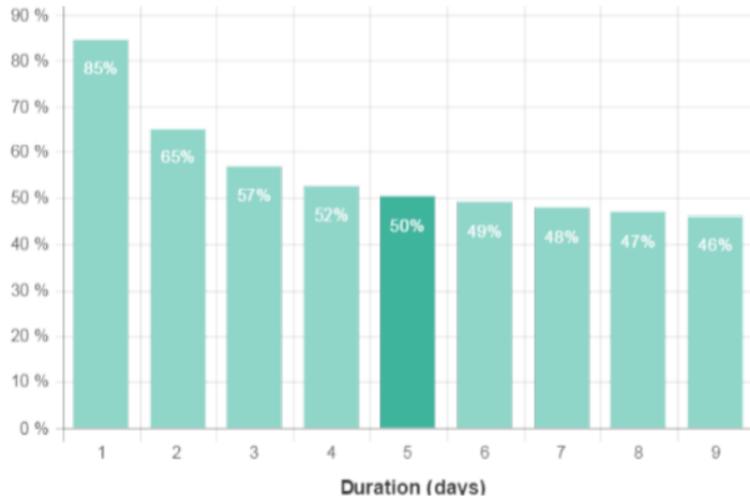
Roof 5,100 sq.ft.      Parking 0 sq.ft.

## Battery System

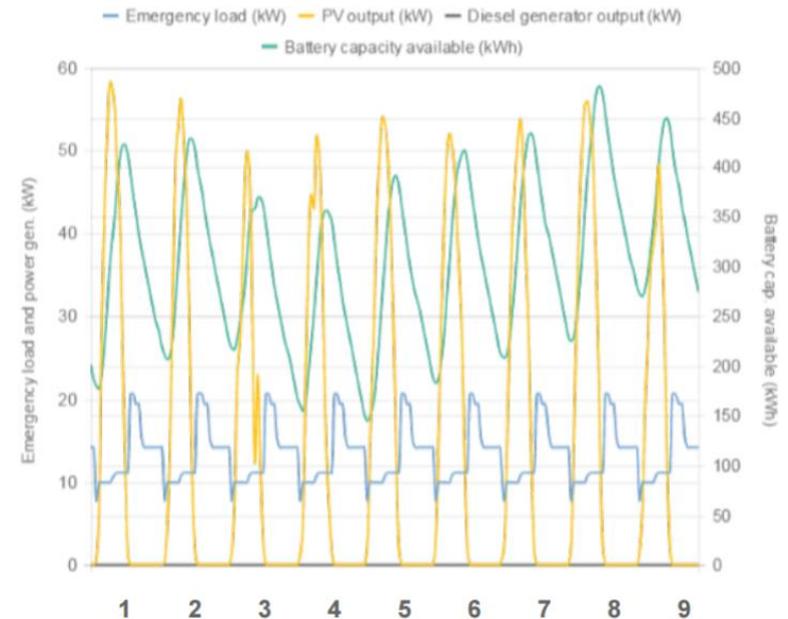
System size:  
125kW / 500 kWh

Space required:  
430 cu.ft.

## System Duration - Probability



## System Operation During Design Days



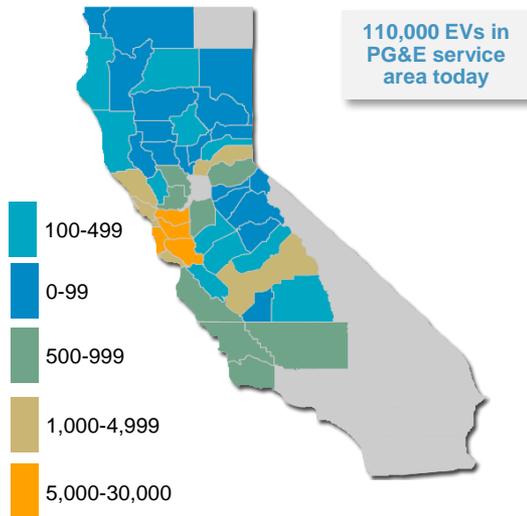
# The Opportunity: DERs



# Energy Storage + Electric Vehicles

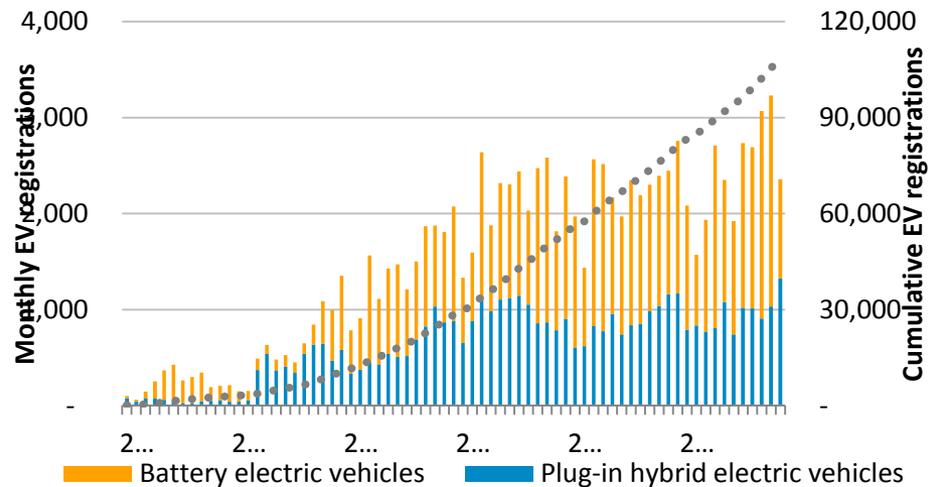


## Cumulative EV Sales by County PG&E Service Area



PG&E's service area adds over 2,400 new EVs per month.

Adoption has been strongest around the Bay Area.



Sources: EPRI, R.L. Polk Data, 2016, and Pacific Gas and Electric Company



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